

## CLAIMS

What is claimed is:

1. A method of calculating comb filter error used for decoding an NTSC video signal, said method comprising:

5 storing a plurality of consecutive video lines of said video signal, said plurality of consecutive video lines including a first video line, a second video line appearing immediately before said first video line, and a third video line appearing immediately before said second video line;

receiving a current video line of said video signal, wherein said current video line appears  
10 immediately after said first video line;

obtaining a first difference between said current video line and said second video line;

obtaining a second difference between said first video line and said third video line; and

filtering said video signal for separating components in said video signal, based on said differences.

15 2. The method of claim 1, wherein said filtering performs notch filtering if each of said differences is above a predetermined threshold.

3. The method of claim 2, wherein said filtering performs comb filtering if one of said differences is not above said predetermined threshold, said method further comprising:  
comparing said first difference and said second difference to determine a minimum error,  
20 wherein said filtering performs comb filtering based on said minimum error.

4. The method of claim 1 further comprising: comparing said first difference and said second difference to determine a minimum error, wherein said filtering performs comb filtering based on said minimum error.

5. The method of claim 1, wherein said plurality of consecutive video lines includes a fourth video line appearing immediately before said third video line, and wherein said method further comprising: obtaining a third difference between said second video line and said fourth video line.

5 6. The method of claim 5, wherein said filtering performs notch filtering if each of said differences is above a predetermined threshold.

7. The method of claim 6, wherein said filtering performs comb filtering if one of said differences is not above said predetermined threshold, said method further comprising: comparing said first difference and said second difference to determine a minimum error,  
10 wherein said filtering performs comb filtering based on said minimum error.

8. The method of claim 5 further comprising: comparing said first difference and said second difference to determine a minimum error, wherein said filtering performs comb filtering based on said minimum error.

9. A method of comb filter calculation used for decoding an NTSC video signal, said  
15 method comprising:

storing a plurality of consecutive video lines of said video signal, said plurality of consecutive video lines including a first video line, a second video line appearing immediately before said first video line, and a third video line appearing immediately before said second video line;

20 receiving a current video line of said video signal, wherein said current video line appears immediately after said first video line;

obtaining a first difference and a first summation between said first video line and said second video line;

obtaining a second difference and a second summation between said second video line and said third video line;

obtaining a first value equal to twice said second video line plus a summation between said first video line and said third video line;

5 obtaining a second value equal to twice said second video line less a summation between said first video line and said third video line; and

comb filtering said video signal for separating components in said video signal, based on said first difference, said first summation, said second difference, said second summation, said first value and said second value.

10 10. The method of claim 9, wherein said plurality of consecutive video lines includes a fourth video line appearing immediately before said third video line.

11. A method of calculating comb filter error used for decoding PAL video signal, said method comprising:

15 storing a plurality of consecutive video lines of said video signal, said plurality of consecutive video lines including a first video line, a second video line appearing immediately before said first video line, and a third video line appearing immediately before said second video line;

receiving a current video line of said video signal, wherein said current video line appears immediately after said first video line;

20 obtaining a first summation between said current video line and said second video line;  
applying a V-switch to said first summation to generate a first V-switch value;  
obtaining a first difference between said current video line and said second video line;  
applying a ninety-degree rotation to said first difference to generate a first rotation value;

adding said first V-switch value and said first rotation value to generate a first addition value;

multiplying said first line by two to generate a first multiplication value;

obtaining a first error value based on a difference between said first addition value and

5 said first multiplication value;

filtering said video signal for separating components in said video signal, based on said first error value.

12. The method of claim 11 further comprising:

obtaining a second summation between said first video line and said third video line;

10 applying a V-switch to said second summation to generate a second V-switch value;

obtaining a second difference between said first video line and said third video line;

applying a ninety-degree rotation to said second difference to generate a second rotation

value;

adding said second V-switch value and said second rotation value to generate a second

15 addition value;

multiplying said second line by two to generate a second multiplication value; and

obtaining a second error value based on a difference between said second addition value

and said second multiplication value;

wherein said filtering said video signal separates components in said video signal, based

20 on said first error value and said second error value.

13. The method of claim 12, wherein said filtering performs notch filtering if each of said first error value and said second error value is above a predetermined threshold.

14. The method of claim 13, wherein said filtering performs comb filtering if one of

said first error value and said second error value is not above said predetermined threshold, said method further comprising: comparing said first error value and said second error value to determine a minimum error, wherein said filtering performs comb filtering based on said minimum error.

5           15.     The method of claim 12 further comprising: comparing said first error value and said second error value to determine a minimum error, wherein said filtering performs comb filtering based on said minimum error.

          16.     The method of claim 12, wherein said plurality of consecutive video lines includes a fourth video line appearing immediately before said third video line, and wherein said  
10   method further comprising:

          obtaining a third summation between said second video line and said fourth video line;

          applying a V-switch to said third summation to generate a third V-switch value;

          obtaining a third difference between said second video line and said fourth video line;

          applying a ninety-degree rotation to said third difference to generate a third rotation  
15   value;

          adding said third V-switch value and said third rotation value to generate a third addition value;

          multiplying said third line by two to generate a third multiplication value; and

          obtaining a third error value based on a difference between said third addition value and  
20   said third multiplication value;

          wherein said filtering said video signal separates components in said video signal, based on said first error value, said second error value and said third error value.

          17.     The method of claim 16, wherein said filtering performs notch filtering if each of

said first error value, said second error value and said third error value is above a predetermined threshold.

18. The method of claim 17, wherein said filtering performs comb filtering if one of said first error value, said second error value and said third error value is not above said  
5 predetermined threshold, said method further comprising: comparing said first error value, said second error value and said third error value to determine a minimum error, wherein said filtering performs comb filtering based on said minimum error.

19. The method of claim 16 further comprising: comparing said first error value, said second error value and said third error value to determine a minimum error, wherein said  
10 filtering performs comb filtering based on said minimum error.

20. A decoder capable of calculating comb filter error used for decoding an NTSC video signal, said decoder comprising:

a memory configured to store a plurality of consecutive video lines of said video signal, said plurality of consecutive video lines including a first video line, a second video line  
15 appearing immediately before said first video line, and a third video line appearing immediately before said second video line;

a receiver configured to receive a current video line of said video signal, wherein said current video line appears immediately after said first video line;

a controller configured to obtain a first difference between said current video line and  
20 said second video line, to obtain a second difference between said first video line and said third video line; and

a filter configured to filter said video signal for separating components in said video signal, based on said differences.

21. The decoder of claim 20, wherein said filter performs notch filtering if each of said differences is above a predetermined threshold.

22. The decoder of claim 21, wherein said filter performs comb filtering if one of said differences is not above said predetermined threshold, said method further comprising:

5 comparing said first difference and said second difference to determine a minimum error, wherein said filtering performs comb filtering based on said minimum error.

23. The decoder of claim 20, wherein said controller compares said first difference and said second difference to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.

10 24. The decoder of claim 20, wherein said plurality of consecutive video lines includes a fourth video line appearing immediately before said third video line, and wherein said controller obtains a third difference between said second video line and said fourth video line.

25. The decoder of claim 24, wherein said filter performs notch filtering if each of said differences is above a predetermined threshold.

15 26. The decoder of claim 25, wherein said filter performs comb filtering if one of said differences is not above said predetermined threshold, wherein said controller compares said first difference and said second difference to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.

20 27. The method of claim 24, wherein said controller compares said first difference and said second difference to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.

28. A decoder capable of calculating comb filter error used for decoding a PAL video signal, said decoder comprising:

a memory configured to store a plurality of consecutive video lines of said video signal, said plurality of consecutive video lines including a first video line, a second video line appearing immediately before said first video line, and a third video line appearing immediately before said second video line;

5 a receiver configured to receive a current video line of said video signal, wherein said current video line appears immediately after said first video line;

a controller configured to obtain a first summation between said current video line and said second video line, to apply a V-switch to said first summation to generate a first V-switch value, to obtain a first difference between said current video line and said second video line, to  
10 apply a ninety-degree rotation to said first difference to generate a first rotation value, to add said first V-switch value and said first rotation value to generate a first addition value, to multiply said first line by two to generate a first multiplication value, and to obtain a first error value based on a difference between said first addition value and said first multiplication value;

a filter configured to filter said video signal for separating components in said video  
15 signal, based on said first error value.

29. The decoder of claim 28, wherein said controller further obtains a second summation between said first video line and said third video line, applies a V-switch to said second summation to generate a second V-switch value, obtains a second difference between said first video line and said third video line, applies a ninety-degree rotation to said second  
20 difference to generate a second rotation value, adds said second V-switch value and said second rotation value to generate a second addition value, multiplies said second line by two to generate a second multiplication value, and obtains a second error value based on a difference between said second addition value and said second multiplication value; and



wherein said filter separates components in said video signal, based on said first error value and said second error value.

30. The decoder of claim 29, wherein said filter performs notch filtering if each of said first error value and said second error value is above a predetermined threshold.

5 31. The decoder of claim 30, wherein said filter performs comb filtering if one of said first error value and said second error value is not above said predetermined threshold, wherein said controller compares said first error value and said second error value to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.

10 32. The decoder of claim 29, wherein said controller compares said first error value and said second error value to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.

33. The decoder of claim 29, wherein said plurality of consecutive video lines includes a fourth video line appearing immediately before said third video line;

15 wherein said controller obtains a third summation between said second video line and said fourth video line, applies a V-switch to said third summation to generate a third V-switch value, obtains a third difference between said second video line and said fourth video line, applies a ninety-degree rotation to said third difference to generate a third rotation value, adds said third V-switch value and said third rotation value to generate a third addition value, multiplies said third line by two to generate a third multiplication value, and obtains a third error  
20 value based on a difference between said third addition value and said third multiplication value; and

wherein said filter separates components in said video signal, based on said first error value, said second error value and said third error value.

34. The decoder of claim 33, wherein said filter performs notch filtering if each of said first error value, said second error value and said third error value is above a predetermined threshold.

35. The decoder of claim 34, wherein said filter performs comb filtering if one of said  
5 first error value, said second error value and said third error value is not above said predetermined threshold, wherein said controller compares said first error value, said second error value and said third error value to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.

36. The decoder of claim 33, wherein said controller compares said first error value,  
10 said second error value and said third error value to determine a minimum error, and wherein said filter performs comb filtering based on said minimum error.